



**MCB-1603010702020700** Seat No. \_\_\_\_\_

**M. Sc. (Physics) (Sem. II) (CBCS) Examination**

**April / May - 2018**

**CT - 7 : Space Physics**

Time :  $2\frac{1}{2}$  Hours]

[Total Marks : 70

**Instructions :** Attempt all questions. The figure on right indicates marks.

**1** Answer Any **Seven** of the following : **14**

- (a) Explain in brief "Geopotential Height"
- (b) What is Exosphere? Write the equation for gaseous escape.
- (c) Name any two empirical model of the atmosphere.
- (d) Draw the Earth's geomagnetic cavity and name the regions.
- (e) Why ozone is so important in the atmosphere?
- (f) Explain the Snell's law of refraction.
- (g) Explain the Wein's displacement law.
- (h) What is solar flare?
- (i) What do you mean by critical frequency? How the critical frequency of the layer is defined?
- (j) Explain electron loss due to attachment.

**2** Answer Any **Two** of the followings :

- (a) Describe atmospheric nomenclature based on composition and temperature. **7**
- (b) What is hydrostatic equilibrium? Explain the "scale height". **7**
- (c) Describe the "Enthalpy" and "Entropy" in details with examples. **7**

- 3** Answer the following :
- (a) Write the assumptions made by Chapman in his production theory. Derive the production function and explain the zenith angle dependency. **7**
- (b) Explain the alpha and beta layers. **7**

**OR**

- 3** Answer the following :
- (a) Write the simplified Appleton - Hartree formula. Explain how this is used in the instrument "Ionosonde" for vertical incidence. Draw the block diagram and explain the function of Ionosonde. **7**
- (b) Describe the radio wave propagation and refraction using Snell's formula. **7**

- 4** Answer Any **Two** of the followings :
- (a) Describe the interaction of solar energy with Earth's atmosphere through scattering and absorption. Define atmospheric window. **7**
- (b) Define the term "spectral reflectance". Show how this property can be used to identify the deciduous and coniferous trees. **7**
- (c) Explain how the black body concept is used in remote sensing. Draw the radiation curves at different temperatures ranging from 6000K to 300K. Discuss the Wein's displacement. **7**

- 5** Write short notes on Any **Two** : **14**
- (a) Langmuir probe - characteristic and application
- (b) Production and loss of atmospheric ozone.
- (c) Nomenclature of Earth's ionosphere
- (d) Sun- Its composition and different regions.